

an average of \$7.73 an hour in 1997. Owners of shoe repair and custom shoe manufacturing shops typically earn substantially more than beginning salaried workers.

Related Occupations

Other workers who make or repair items using handtools and machinery include dressmakers, custom tailors and sewers, designers and patternmakers, and furriers.

Sources of Additional Information

For information about the custom-made prescription shoe business and training opportunities in this field, contact:

☛ Pedorthic Footwear Association, 7150 Columbia Gateway Dr., Suite G, Columbia, MD 21046. Internet: www.pedorthics.org

Textile Machinery Operators

(O*Net 92702, 92705, 92708, 92711, and 92714)

Significant Points

- Employment is expected to decline, primarily due to more productive machinery and open international trade.
- Because the textile industry is highly automated, persons with technical skills and some computer training will have the best opportunities.
- Night and weekend shifts are common, because many textile and fiber mills operate 24 hours a day.
- Earnings are low.

Nature of the Work

Textile machinery operators tend machines that manufacture a wide range of textile products. Most people know that textiles are used to make hosiery, towels, and socks; but many are surprised to learn that textile products are used in such things as roofs, tires, and roads. Textile machinery operators play an important part in producing all these goods, by controlling equipment that cleans, cards, combs, and draws fiber; spins fiber into yarn; and weaves, knits, or tufts yarn into textile products. These workers are responsible for numerous machines that they start, stop, clean, and monitor for proper functioning.

There are many phases in the textile production process, and operators' duties depend on the product and type of machinery used. The process begins with the preparation of synthetic or natural fibers for spinning. Fibers are cleaned and aligned through processes called carding and combing. To prepare the fiber for spinning, very short fibers and foreign matter are removed, and the fibers are drawn into a substance called sliver. During this process, different types of fibers may be combined, to give products a desired texture, durability, or other characteristics. Operators constantly monitor their machines during this stage, checking the movement of the fiber, removing and replacing cans of sliver, repairing breaks in the sliver, and making minor repairs to the machinery. The full cans of sliver are then taken to the spinning area, where they are drawn and twisted onto bobbins to produce yarn. (This is an automated version of the old fashion spinning wheel.)

In contrast to the process described above, some workers oversee machinery that makes fibers from wood pulp or chemicals. To produce this fiber, wood pulp or chemical compounds are melted or dissolved in a liquid, which is then extruded, or forced, through holes in a metal plate, called a spinneret. The sizes and shapes of the holes in the spinneret determine the shape and uses of the fiber. Workers adjust the flow of fiber base through the spinneret, repair breaks in the fiber, and make minor adjustments to the machinery. Because this fiber is created

through a chemical process, chemical companies, not textile mills, employ the majority of these workers.

Whether natural or manufactured, finished yarn is then taken to be woven, knitted, tufted, or bonded with heat or chemicals. Each of these processes creates a different type of textile product and requires a different type of machine. Woven fabrics are made on looms that interlace the yarn. Knit products, such as socks or women's hosiery, are produced by intermeshing loops of yarn. Carpeting is made through the tufting process, in which the loops of yarn are pushed through a backing material. Although the processes are now highly automated, these concepts have been used for many centuries to produce textile products.

Once the yarn has been woven, knitted, or tufted, the resulting fabric is ready to be dyed and finished—either at the textile mill or at a plant specializing in textile finishing. Depending on the end use of the yarn, it may be dyed before or after it is woven, knitted, or tufted. Some fabric is treated before it is dyed, to remove other chemical additives that could affect the quality of the finished product. Products are often finished by treating them to prevent excessive shrinkage, provide strength, make them stain-resistant, or give them a silky luster. In the production of hosiery and socks, for example, the stocking or sock is placed on a form and then exposed to steam and heat to give it shape.

Textile machinery operators play a vital role in all of the various processes described above. In spite of this wide range of processes, operators share many responsibilities. Most prepare their machinery prior to a production run and help maintain the equipment, by adjusting the timing on a machine, threading the harnesses that create patterns in textile goods, and repairing machinery. Each operator oversees numerous machines, performing such duties as repairing breaks in the yarn and monitoring its supply. Because highly automated machinery is used in textile mills, computers control many of the processes, making it possible for each operator to monitor a large area or number of machines. The complexity of many machines often requires operators to specialize in a particular type of machine.

Working Conditions

Most textile machine operators work in textile mills or chemical plants. Working conditions in these facilities depend on the age and degree of modernization of the factory. New facilities usually offer ventilation and climate control that reduce potential problems caused by airborne fibers and fumes. In a few old facilities, workers in areas with high levels of airborne materials often use protective glasses and masks that cover their noses and mouths.

Although some new machinery is relatively quiet, a number of workers still wear ear protection. Many machines operate at high speeds, and workers must be careful not to wear clothing or jewelry that could get caught in moving parts. In addition, many extruding and



Textile production is highly automated.

forming machine operators wear protective shoes and clothing, when working with certain chemical compounds.

Most textile machinery operators work a standard 40-hour week. Night and weekend shifts are common, because many textile and fiber mills operate 24 hours a day. Employers often use a rotating schedule of shifts, however, so operators do not consistently work nights or weekends.

Employment

Textile machinery operators held about 277,000 jobs in 1998. Most of these workers were employed in weaving, finishing, yarn, and thread mills; but knitting mills and manufactured fiber producers also employed a significant share. Most extruding and forming machine operators were employed in chemical plants.

North Carolina, Georgia, and South Carolina were the leading States in the employment of textile workers. Most of the remaining workers were employed in other southern States, California, and the Northeast.

Training, Other Qualifications, and Advancement

Although not required for all machine-operating positions, a high school diploma or its equivalent is becoming common for entry-level positions in many mills. Some mills prefer applicants to possess a high school diploma and additional technical training. This training may be obtained, in part, at a formal training institution, such as a technical school. Experienced workers or representatives of machinery manufacturers may offer extensive on-the-job training.

As the textile industry becomes more highly automated, some operators will need to understand complex machinery and be able to diagnose problems. Because textile machinery is increasingly controlled electronically, jobseekers will benefit from a basic knowledge of computers and electronics.

Physical stamina and manual dexterity are important attributes for these jobs. In addition, self-direction and interpersonal skills are becoming important for textile machinery operators, as organizational changes that promote teamwork and encourage few levels of management are leading operators to assume increasing responsibility and to take initiative.

Textile machinery operators can advance in several ways. Some workers become instructors and train new employees. Others advance by taking positions requiring additional skills and increased responsibility. A number of experienced operators are promoted to first-line supervisory positions.

Job Outlook

Employment of textile machinery operators is expected to decline over the 1998-2008 period. The most important factors influencing the employment outlook will be increased worker productivity through the introduction of labor-saving machinery and an open trading environment. In spite of the projected decline, many openings will be created annually, as workers change occupations or leave the labor force. Because the textile industry is highly automated, persons with technical skills and some computer training will have the best opportunities.

Employment is expected to decline, as textile firms respond to growing competition in coming years by investing in new equipment, reorganizing work practices, and consolidating. New machinery, such as faster air jet looms and computer-integrated manufacturing technology, will increase productivity and allow each operator to monitor a large number of machines. Many factories are also reorganizing production floors to further increase productivity and to give workers additional responsibility. Also, textile firms are merging to benefit from economies of scale and to pool resources to invest in new equipment. Although each of the above practices should make the textile industry increasingly competitive, these practices will adversely affect the employment outlook for many machine operators.

Another major uncertainty for textile workers is the future of trade. Recent trade initiatives, like the North American Free Trade Agreement and the Agreement on Textiles and Clothing of the World Trade Organization,

will help to open export markets for textiles produced in the United States. At the same time, they will dismantle much of the protection that has been provided to the industry for decades, leading to more textile imports and relocation of textile mills to other countries. While the textile industry will be able to compete in many product lines, the labor-intensive U.S. apparel industry will be more adversely affected by these trade initiatives. This, in turn, will negatively affect the demand for textile machinery operators, because the apparel industry is the largest consumer of American-made textiles.

In contrast to other textile machine operating occupations, extruding machine operators, who produce synthetic fibers are expected to experience growing employment in coming years. Because this occupation is small, however, growth is projected to create only a small number of new openings.

Earnings

Median hourly earnings of textile draw-out and winding machine operators, who account for about two-thirds of textile machinery operators, were \$9.37 in 1998. The middle 50 percent earned between \$7.84 and \$10.62. The lowest 10 percent had earnings of less than \$6.61, whereas the top 10 percent earned over \$12.20.

Median hourly earnings for other textile machinery operators in 1998 were \$13.43 for extruding and forming machine operators, \$10.40 for textile machine setters and set-up operators, and \$9.31 for textile bleaching and dyeing machine operators. In general, earnings vary significantly, depending on the type of mill, job specialty, shift, and seniority. In addition to typical benefits, some firms provide on-site daycare facilities, educational benefits, and employee discounts in company-owned outlet stores.

Related Occupations

Metalworking and plastics-working machine operators perform similar duties and have many of the same entry and training requirements as extruding and forming machine operators and tenders, textile machine operators and tenders, and textile bleaching and dyeing machine operators. Setters and setup operators in other industries—metal fabrication and plastics manufacturing, for example—perform duties comparable to those of textile machine setters and setup operators.

Sources of Additional Information

Information about job opportunities in textile and synthetic fiber production is available from local employers and local offices of the State employment service.

For general information on careers, technology, and trade regulations in the textile industry, contact:

✦ American Textile Manufacturers Institute, Inc., 1130 Connecticut Ave. NW., Suite 1200, Washington, DC 20036-3954.

Internet: <http://www.atmi.org>

✦ Institute of Textile Technology, 2551 Ivy Rd., Charlottesville, NC 22903-4614. Internet: <http://www.itt.edu>

Upholsterers

(O*NET 89508)

Significant Points

- About 1 out of 3 is self-employed—triple the average for all craft workers.
- Most upholsterers gain experience through on-the-job training.
- Opportunities for experienced upholsterers should be good, because few people enter the occupation and few shops offer training.